

REMARKS

This Amendment is submitted in response to the non-final Office Action mailed on July 20, 2009. No fee is due in connection with this Amendment. The Director is authorized to charge any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112857-463 on the account statement.

Claims 13-24 are pending in this application. Claims 1-12 were previously canceled without prejudice or disclaimer. In the Office Action, the Title is objected to. Furthermore, Claims 12-24 are rejected under 35 U.S.C. §103. In response, Claims 13 and 23-24 have been amended. The amendments do not add new matter. At least in view of the amendments and/or for the reasons set forth below, Applicant respectfully submits that the rejections should be withdrawn.

In the Office Action, the Title is objected to as not being sufficiently descriptive. In response, Applicant has amended the Title of the Specification to recite "A COMPACT FUEL CELL SEPARATOR INCORPORATING FLUID OXIDANT SUPPLY MEANS, A FUEL CELL DEVICE AND AN ELECTRONIC APPLIED DEVICE INCORPORATING THE COMPACT FUEL CELL SEPARATOR." This amendment does not add new matter. The amendment is supported in the Specification at, for example, Abstract.

In the Office Action, Claims 13-16, 21 and 23 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication No. 07-249419 to Goto et al. ("*Goto*") in view of U.S. Patent No. 5,258,239 to Kobayashi ("*Kobayashi*"). In response, Applicant has amended independent Claims 13 and 23. In view of the amendments and/or for at least the reasons set forth below, Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of independent Claims 13 and 23 and Claims 14-16 and 21 that depend therefrom. Furthermore, Applicant respectfully submits that one of ordinary skill in the art would have no reason to combine the cited references to arrive at the present claims.

Currently amended independent Claims 13 and 23 recite, in part, a fuel cell separator comprising: a separator body adapted to contact with a generating element to create electrical continuity to said generating element, thereby forming a generating cell, wherein the generating element is a MEA adapted to receive hydrogen gas or methanol as fuel; a fluid oxidant supply

channel formed on said separator body to supply a fluid oxidant to said generating element; and fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump. These amendments do not add new matter. The amendments are supported in the Specification at, for example, Abstract, lines 4-14; page 3, paragraph 36, lines 16-23; paragraph 41; page 4, paragraph 42, lines 4-20; paragraph 45, lines 1-14; page 5, paragraph 52, lines 11-14; paragraph 55; paragraph 56, lines 5-9; page 7, paragraph 65, lines 8-16 and 19-23; paragraph 71, lines 9-25; page 8, paragraph 72; Figs. 1A-4B.

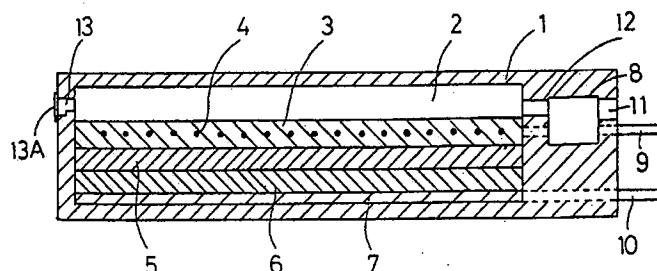
Conventional fuel cells include an MEA sandwiched between a pair of separators and having a planar structure. See, Specification, page 1, paragraph 2. These conventional fuel cells include an air supplying fan provided along a side surface of the fuel cell body to collectively supply air to all the fluid oxidant supply channels of the separator. See, Specification, page 1, paragraph 5, lines 14-24. However, when the air supplying fan is provided separately from the fuel cell body, the layout and reduction in size of the fuel cell is limited by the air supplying fan. See, Specification, page 1, paragraph 6. Therefore, the present claims provide a fuel cell having a separator body adapted to contact an MEA and fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into the fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump. By providing the fluid oxidant supply fan or pump within the separator body, the limitations on the layout and size of the fuel cell can be reduced. See, Specification, page 3, paragraph 41, lines 9-16. In contrast, the cited references fail to disclose or suggest every element of the present claims.

For example, the combination of *Goto* and *Kobayashi* fails to disclose or suggest fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump as recited, in part, by independent Claim 13. The Patent Office asserts that *Goto* discloses fluid oxidant supply means 59 provided on the separator body for supplying fluid oxidant into the fluid oxidant channel. See, Office Action, page 3, lines 7-9. However, Applicant respectfully submits that one skilled in the art would understand that the flow control valves 59 and 69 are merely fluid oxidant

regulating means, rather than fluid oxidant supplying means selected from the group consisting of a fan and a pump. As such, Applicant respectfully submits that the flow control valves 59 and 69 are not fluid oxidant supply means within the meaning of the present claims.

The Patent Office further asserts that *Goto* is silent regarding the fluid oxidant supply means comprising at least one element selected from the group consisting of a fan and a pump. See, Office Action, page 3, lines 10-11. However, Applicant respectfully submits that the Patent Office has misinterpreted *Goto* in an attempt to reconstruct the present claims by alleging that the flow control valves 59 and 69 are fluid oxidant “supply means” provided on the separator body. Directly contrary to the Patent Office’s assertion, *Goto* is not “silent” regarding its fluid oxidant supply means comprising a fan or a pump. Instead, *Goto* teaches that its fluid oxidant supply means is an external pump, rather than the internal flow control valves 59 and 69 relied on by the Patent Office. For example, *Goto* expressly teaches that the oxidant gas in its fuel cell is supplied with a pump 92. See, *Goto*, paragraph 39; Drawing 1. *Goto* also clearly shows that fluid oxidant supply pump 92 is external to the fuel cell and separator bodies. See, *Goto*, Drawings 1 and 2. As a result, even with the oxidant gas control valves 59 and 69 formed on the separator body, the design and size of the fuel cell of *Goto* is limited by the externally provided air supply pump 92. Thus, *Goto* fails to disclose or suggest that its fluid oxidant supply means is provided within the separator body as required, in part, by the present claims.

Kobayashi also fails to disclose a fluid oxidant supply pump or fan provided within the separator body as required, in part, by independent Claim 13. The Patent Office asserts that *Kobayashi* teaches a diaphragm pump which is “integrated with the cell casing (1) which forms the air flow channel (2) to provide air supply control and enhance the electrical characteristics of the cell.” See, Office Action, page 3, lines 15-18. Although *Kobayashi* shows that its diaphragm pump 8 is provided within the cell casing 1, *Kobayashi* fails to disclose that its diaphragm pump 8 is provided within the separator body 5. See, *Kobayashi*, column 2, lines 46-68; Fig. 1. In fact, Fig. 1 of *Kobayashi* clearly shows that piezo-electric pump 8 is external to the separator 5:



See, *Kobayashi*, Fig. 1. Therefore, even if one of ordinary skill in the art combined the piezo-electric pump of *Kobayashi* with the fuel cell of *Goto*, the claimed combination fails to disclose or even suggest a fluid oxidant supply means selected from the group consisting of a pump and a fan provided within the separator body in accordance with the present claims.

The Patent Office asserts that “[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to apply *Kobayashi*’s diaphragm pump in place of the flow control valve in *Goto*’s separator because *Kobayashi* teaches that this pump is a device which can provide air supply control and enhance the electrical characteristics of the cell.” See, Office Action, page 3, lines 18-22. However, contrary to the Patent Office’s assertion, Applicant respectfully submits that one skilled in the art would have no reason to substitute the air supply pump of *Kobayashi* for the flow control valves 59 and 69 of *Goto* because *Goto* already discloses an air supply pump 92. If one skilled in the art were to simply replace the flow control valves 59 and 69 of *Goto* with the diaphragm pump of *Kobayashi*, the combination would result in a fuel cell with two air supply pumps: the pump 92 taught by *Goto* and the diaphragm pump 8 of *Kobayashi*.

In addition, one skilled in the art would have no reason to replace the flow control valves of *Goto* with the diaphragm pump of *Kobayashi* because it would render the fuel cell of *Goto* unfit for its intended purpose. *Goto* is entirely directed to a fuel cell which provides more exact temperature control without depending solely on the adjustment of the cooling fluid flow. See, *Goto*, paragraphs 11-13. *Goto* teaches that its objective is achieved by providing an oxidant gas flow control valve in the oxidant gas passage, wherein the opening created by the flow control valve changes according to the temperature in the oxidant gas passage. See, *Goto*, paragraphs 14-15. *Goto* further teaches that “[f]low control by the above-mentioned fuel flow control means decreases a flow of fuel gas which flows through the fuel branch way concerned, when temperature of the above-mentioned fuel gas is high, and when temperature of the above-mentioned fuel gas is low, it may be made in the direction which increases a flow of fuel gas which flows through the fuel branch way concerned.” See, *Goto*, paragraph 18. Therefore, the flow control valves 59 and 69 of *Goto* are essential to its stated purpose of more accurately controlling the temperature of the fuel cell, and one of ordinary skill in the art would thus have no reason to replace the flow control valves 59 and 69 with an additional pump that would not regulate the temperature of the fuel cell.

Accordingly, Applicant respectfully requests that the rejection of Claims 13-16, 21 and 23 under 35 U.S.C. §103(a) to *Goto* and *Kobayashi* be withdrawn.

In the Office Action, Claims 17-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of U.S. Patent No. 6,500,575 B1 to Shiue et al. ("*Shiue*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claims 17-20.

As discussed previously, *Goto* and *Kobayashi* fail to disclose or suggest fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump as required, in part, by independent Claim 13 from which Claims 17-20 depend. The Patent Office relies on *Shiue* merely for the disclosure of a fan as the fluid oxidant supply means. See, Office Action, page 5, lines 4-15. Nowhere does *Shiue* disclose or suggest that its fan is provided within the separator body, nor does the Patent Office cite support for such claimed element. In fact, *Shiue* expressly teaches that its micro fans 15 are "installed in the middle region of the first and second cap. . . of the battery 10" at a location above the separator sheet 122. See, *Shiue*, column 3, lines 60-65; column 4, lines 19-23; Figs. 1-2. As such, even if combinable, *Shiue* fails to remedy the deficiencies of *Goto* and *Kobayashi* with respect to Claims 17-20.

Accordingly, Applicant respectfully requests that the rejection of Claims 17-20 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi* and *Shiue* be withdrawn.

In the Office Action, Claim 22 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of *Shiue* and U.S. Patent No. 5,856,035 to Khandkar et al. ("*Khandkar*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claim 22.

As discussed previously, *Goto*, *Kobayashi* and *Shiue* fail to disclose or suggest fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump as required, in part, by independent Claim 13 from which Claim 22 depends. The Patent Office relies on *Khandkar* merely for the disclosure of a separator having an elongated opening for providing fuel or air flow. See, Office Action, page 5, lines 20-21; page 6, lines 1-9. Nowhere does

Khandkar disclose or suggest a fluid oxidant supply fan or pump provided within the separator body, nor does the Patent Office cite support for such claimed element. As such, even if combinable, *Khandkar* fails to remedy the deficiencies of *Goto*, *Kobayashi* and *Shiue* with respect to Claim 22.

Accordingly, Applicant respectfully requests that the rejection of Claim 22 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi*, *Shiue* and *Khandkar* be withdrawn.

In the Office Action, Claim 24 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of U.S. Patent No. 6,127,058 to Pratt et al. ("*Pratt*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claim 24.

Currently amended independent Claim 24 recites, in part, an electronic applied device having a board and a plurality of fuel cell bodies provided on said board at required positions, each of said fuel cell bodies having a fuel cell separator and a generating element, said fuel cell separator comprising: a separator body adapted to contact with said generating element to make electrical continuity to said generating element, wherein the generating element is a MEA adapted to receive hydrogen gas or methanol as fuel; a fluid oxidant supply channel formed on said separator body to supply a fluid oxidant to said generating element; and fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein said fluid oxidant supply channel comprises a plurality of channels formed on said separator body, wherein said fluid oxidant supplying means comprises a plurality of elements selected from the group consisting of a fan and a pump for individually supplying said fluid oxidant to said channels, and wherein electric power generated from said plurality of fuel cell bodies is supplied to various elements provided on said board. This amendment does not add new matter. The amendment is supported in the Specification at, for example, Abstract, lines 4-14; page 3, paragraph 36, lines 16-23; paragraph 41; page 4, paragraph 42, lines 4-20; paragraph 45, lines 1-14; page 5, paragraph 52, lines 11-14; paragraph 55; paragraph 56, lines 5-9; page 7, paragraph 65, lines 8-16 and 19-23; paragraph 71, lines 9-25; page 8, paragraph 72; Figs. 1A-4B. In contrast, even if combinable, the cited references are deficient with respect to the present claims.

As discussed previously, *Goto* and *Kobayashi* fail to disclose or suggest fluid oxidant supplying means provided within said separator body for supplying said fluid oxidant into said

fluid oxidant supply channel, wherein said fluid oxidant supplying means comprises at least one element selected from the group consisting of a fan and a pump as required, in part, by independent Claim 24. The Patent Office relies on *Pratt* merely for the disclosure of an electronic applied device comprising a board in which a plurality of fuel cell bodies are provided. See, Office Action, page 6, lines 19-22; page 7, lines 1-6. Nowhere does *Pratt* disclose or suggest a fluid oxidant supply fan or pump provided within the separator body, nor does the Patent Office cite support for such claimed element. As such, even if combinable, *Pratt* fails to remedy the deficiencies of *Goto* and *Kobayashi* with respect to Claim 24.


Accordingly, Applicant respectfully requests that the rejection of Claim 24 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi* and *Pratt* be withdrawn.

For the foregoing reasons, Applicant respectfully submits that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

K&L GATES LLP

BY



Thomas C. Basso
Reg. No. 46,541
Customer No. 29175

Date: October 20, 2009